

09/806003

Practitioner's Docket No. 55709

CHAPTER II

**TRANSMITTAL LETTER
TO THE UNITED STATES ELECTED OFFICE (EO/US)
(ENTRY INTO U.S. NATIONAL PHASE UNDER CHAPTER II)**

<u>PCT/DE99/02994</u>	<u>17 September 1999</u>	<u>23 September 1998</u>
INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED

METHOD AND CIRCUIT ARRANGEMENT FOR PICTURE-IN-PICTURE INSERTION
TITLE OF INVENTION

Maik BRETT and Manfred MENDE
APPLICANTS

Box PCT
Assistant Commissioner for Patents
Washington D.C. 20231
ATTENTION: EO/US

NOTE: To avoid abandonment of the application, the applicant shall furnish to the USPTO, not later than 20 months from the priority date: (1) a copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the USPTO; and (2) the basic national fee (see 37 C.F.R. § 1.492(a)). The 30-month time limit may not be extended. 37 C.F.R. § 1.495.

WARNING: Where the items are those which can be submitted to complete the entry of the international application into the national phase are subsequent to 30 months from the priority date the application is still considered to be in the international state and if mailing procedures are utilized to obtain a date the express mail procedure of 37 C.F.R. § 1.10 must be used (since international application papers are not covered by an ordinary certificate of mailing - See 37 C.F.R. § 1.8.

NOTE: Documents and fees must be clearly identified as a submission to enter the national state under 35 USC 371 otherwise the submission will be considered as being made under 35 USC 111. 37 C.F.R. § 1.494(f).

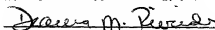
CERTIFICATION UNDER 37 C.F.R. § 1.10*(Express Mail label number is mandatory.)

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I hereby certify that this paper, along with any document referred to, is being deposited with the United States Postal Service on this date March 23, 2001 in an envelope as "Express Mail Post Office to Addressee," mailing Label Number EL835032310, addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

Deanna M. Rivemider

(type or print name of person mailing paper)


Signature of person mailing paper

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1. Applicant herewith submits to the United States Elected Office (EO/US) the following items under 35 U.S.C. 371:

- a. ☒ This express request to immediately begin national examination procedures (35 U.S.C. 371(f)).
- b. ☒ The U.S. National Fee (35 U.S.C. 371(c)(1)) and other fees (37 C.F.R. § 1.492) as indicated below:

2. Fees

CLAIMS FEE	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
<input checked="" type="checkbox"/>	TOTAL CLAIMS	12-20 =	0	x \$ 18.00 =	\$0
	INDEPENDENT CLAIMS	2 - 3 =	0	x \$ 80.00 =	\$0
	MULTIPLE DEPENDENT CLAIM(S) (if applicable) + \$270.00				\$
BASIC FEE**	<input type="checkbox"/> U.S. PTO WAS INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where an International preliminary examination fee as set forth in § 1.482 has been paid on the international application to the U.S. PTO: <input type="checkbox"/> and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness) and industrial activity, as defined in PCT Article 33(2) to (4) have been satisfied for all the claims presented in the application entering the national stage (37 CFR 1.492(a)(4)) \$96.00 <input type="checkbox"/> and the above requirements are not met (37 CFR 1.492(a)(1)) \$670.00 <input checked="" type="checkbox"/> U.S. PTO WAS NOT INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where no international preliminary examination fee as set forth in § 1.482 has been paid to the USPTO, and payment of an international search fee as set forth in § 1.445(a)(2) to the U.S. PTO: <input type="checkbox"/> has been paid (37 CFR 1.492(a)(2)) \$760.00 <input type="checkbox"/> has not been paid (37 CFR 1.492(a)(3)) \$970.00 <input checked="" type="checkbox"/> where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office (37 CFR 1.492(a)(5)) \$860.00				\$860.00
	Total of above Calculations				= \$860.00
SMALL ENTITY	Reduction by 1/2 for filing by small entity, if applicable. Affidavit must be filed. (note 37 CFR 1.9, 1.27, 1.28)				- \$
	Subtotal				\$860.00
	Total National Fee				\$860.00
	Fee for recording the enclosed assignment document \$40.00 (37 CFR 1.21(h)). (See Item 13 below). See attached "ASSIGNMENT COVER SHEET".				\$
TOTAL	Total Fees enclosed				\$860.00

*See attached Preliminary Amendment Reducing the Number of Claims.

- i. ☒ A check in the amount of \$860.00 to cover the above fees is enclosed.
- ii. ☐ Please charge Account No. _____ in the amount of \$ _____.
A duplicate copy of this sheet is enclosed.

(Transmittal Letter to the United States Elected Office (EO/US)—page 3 of 6)

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- ii. ☐ by applicant on _____ Date
- c. ☒ have not been transmitted as
- i. ☒ applicant chose not to make amendments under PCT Article 19.
Date of mailing of Search Report (from form PCT/ISA/210): **10/03/00**
- ii. ☐ the time limit for the submission of amendments has not yet expired.
The amendments or a statement that amendments have not been made will be transmitted before the expiration of the time limit under PCT Rule 46.1.
6. ☒ A translation of the amendments to the claims under PCT Article 19 (38 U.S.C. 371(c)(3)):
- a. ☐ is transmitted herewith.
- b. ☐ is not required as the amendments were made in the English language.
- c. ☒ has not been transmitted for reasons indicated at point 5(c) above.
7. ☒ A copy of the international examination report (PCT/IPEA/409)
- ☒ is transmitted herewith.
- ☐ is not required as the application was filed with the United States Receiving Office.
8. ☐ Annex(es) to the international preliminary examination report
- a. ☐ is/are transmitted herewith.
- b. ☐ is/are not required as the application was filed with the United States Receiving Office.
9. ☐ A translation of the annexes to the international preliminary examination report
- a. ☐ is transmitted herewith.
- b. ☐ is not required as the annexes are in the English language.
10. ☒ An oath or declaration of the inventor (35 U.S.C. 371(c)(4)) complying with 35 U.S.C. 115
- a. ☐ was previously submitted by applicant on _____ Date
- b. ☐ is submitted herewith, and such oath or declaration
- i. ☐ is attached to the application.
- ii. ☐ identifies the application and any amendments under PCT Article 19 that were transmitted as stated in points 3(b) or 3(c) and 5(b); and states that they were reviewed by the inventor as required by 37 C.F.R. 1.70.
- iii. ☒ will follow.

II. Other document(s) or information included:

11. ☒ An International Search Report (PCT/ISA/210) or Declaration under PCT Article 17(2)(a):
- a. ☒ is transmitted herewith.
- b. ☐ has been transmitted by the International Bureau.
Date of mailing (from form PCT/IB/308): _____
- c. ☐ is not required, as the application was searched by the United States International Searching Authority.
- d. ☐ will be transmitted promptly upon request.

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- e. ☐ has been submitted by applicant on _____
Date
12. ☒ An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98:
a. ☒ is transmitted herewith.
Also transmitted herewith is/are:
☒ Form PTO-1449 (PTO/SB/08A and 08B).
☒ Copies of citations listed.
b. ☐ will be transmitted within THREE MONTHS of the date of submission of requirements under 35 U.S.C. 371(c).
c. ☐ was previously submitted by applicant on _____
Date

13. ☐ An assignment document is transmitted herewith for recording.

A separate ☐ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.

14. ☒ Additional documents:
a. ☒ Copy of request (PCT/RO/101)
b. ☒ International Publication No. WO 00/18115
i. ☒ Specification, claims and drawing
ii. ☐ Front page only
c. ☒ Preliminary amendment (37 C.F.R. § 1.121)
d. ☒ Other

Preliminary Amendment, Forms Form PCT/IB/304, PCT/IB/306, English translation of the amended pages filed under Art. 34 PCT, cited references.,

15. ☒ The above checked items are being transmitted
a. ☒ before 30 months from any claimed priority date.
b. ☐ after 30 months.
16. ☐ Certain requirements under 35 U.S.C. 371 were previously submitted by the applicant on _____, namely:

AUTHORIZATION TO CHARGE ADDITIONAL FEES

WARNING: *Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges if extra claims are authorized.*

NOTE: *"A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).*

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NOTE: "Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).

[X] The Commissioner is hereby authorized to charge the following additional fees that may be required by this paper and during the entire pendency of this application to Account No. **04-1105**.

[X] 37 C.F.R. 1.492(a)(1), (2), (3), and (4) (filing fees)

WARNING: Because failure to pay the national fee within 30 months without extension (37 C.F.R. § 1.495(b)(2)) results in abandonment of the application, it would be best to always check the above box.

[X] 37 C.F.R. 1.492(b), (c) and (d) (presentation of extra claims)

NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.492(d)), it might be best not to authorize the PTO to charge additional claim fees, except possible when dealing with amendments after final action.

[X] 37 C.F.R. 1.17 (application processing fees)


[X] 37 C.F.R. 1.17(a)(1)-(5) (extension fees pursuant to § 1.136(a).

[] 37 C.F.R. 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. 1.311(b))

NOTE: Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 C.F.R. § 1.311(b).

NOTE: 37 C.F.R. 1.28(b) requires "Notification of any change in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying . . . issue fee." From the wording of 37 C.F.R. § 1.28(b): (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

[] 37 C.F.R. § 1.492(e) and (f) (surcharge fees for filing the declaration and/or filing an English translation of an International Application later than 30 months after the priority date).



SIGNATURE OF PRACTITIONER

Reg. No.: 33,860

Peter F. Corless

(type or print name of practitioner)

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Docket No. 55709

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Maik BRETT; Manfred MENDE;

Express Mail Label No. EK92917576US

Filed: Herewith

For: METHOD AND CIRCUIT ARRANGEMENT FOR PICTURE-IN-PICTURE
INSERTION

ASSISTANT COMMISSIONER OF PATENTS AND TRADEMARKS
WASHINGTON, D.C. 20231

Sir:

PRELIMINARY AMENDMENT

Applicants file herewith the above-referenced application. Please amend the application as follows.

IN THE CLAIMS

Please claims 1 through 13 without prejudice.

Please add the following new claims.

14. A method for picture-in-picture insertion,
wherein a sequence of insertion pictures ($K_j = K_1, K_2, \dots$) decimated by vertical decimation ($VD \geq 1$) are read into a memory device (S) and subsequently read out,
wherein the insertion pictures (K_j) read out are inserted into a sequence of main pictures ($H_i = H_1, H_2, \dots$),

wherein the memory device (S) has a storage capacity of less than two insertion pictures (K_j) and is subdivided into memory segments (X, Y, Z; A, B, C, D, E) which are continuously overwritten by the insertion pictures, and

wherein a decision is made as to whether the currently written insertion picture (K_j) or the immediately preceding insertion picture (K_{j-1}) is read out,

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wherein more than one memory segment (X,Y,Z;A,B,C,D,E) of the memory device (S) is required for storing an insertion picture (K_j), and in that the memory segments (X,Y,Z;A,B,C,D,E) of the memory device (S) are cyclically overwritten by the insertion pictures (K_j) in a predetermined order.

15. The method of claim 14 wherein the memory segments (X,Y,Z;A,B,C,D,E) are the same size.

16. The method of claim 14 wherein in a manner dependent on the ratio of a reading speed of a read pointer to a writing speed of a write pointer and a relative position of the write pointer in a writing area (I,II; I,II,III) holding the currently written insertion picture, a decision is made as to whether the currently written insertion picture (K_j) or the immediately preceding insertion picture (K_{j-1}) is read out.

17. The method of claim 14 wherein the memory device has a storage capacity which is $(2-1/VD)$ times the storage capacity required for an insertion picture, where VD is the vertical decimation of the insertion picture.

18. The method of claim 17 wherein the memory segments are the same size and the number of memory segments is $2 * VD - 1$, the number of memory segments required for an insertion picture corresponding to the vertical decimation (VD).

19. The method of claim 18 wherein a memory segment has a storage capacity of $1/VD$ times the storage capacity required for an insertion picture and the decision criterion that is applied is whether the last memory segment (II; III) required for the currently written insertion picture is already being written too.

20. The method of claim 14 wherein the insertion pictures (K_j) and main pictures (H_i) are fields of a monitor picture.

21. The method of claim 14 wherein a comparison is made to determine whether a main picture (H_i) and an insertion picture (K_i) to be inserted into the latter have an identical field position, and, in the case of a differing field position, an identical field position is achieved by address shifting of the main picture (H_i) or of the insertion picture.

22. A circuit arrangement for picture-in-picture insertion having a memory device (S) for storing vertically decimated insertion pictures ($K_j=K_1, K_2, \dots$), the memory device (S) having a storage capacity of less than two insertion pictures (K_j) and being subdivided into memory segments (X,Y,Z;A,B,C,D,E) which can be continuously overwritten by the insertion pictures (K_j), having a control device (3) for reading out the vertically decimated insertion pictures from the memory device (S) and for inserting the insertion pictures (K_j) read out into a sequence of main pictures ($H_i=H_1, H_2, \dots$), and having a decision device for deciding whether the currently written insertion picture (K_j) or the immediately preceding insertion picture (K_{j-1}) is read out,

wherein each memory segment (X,Y,Z;A,B,C,D,E) has a storage capacity of less than one insertion picture (K_j), and in that the memory segments (X,Y,Z;A,B,C,D,E) of the memory device (S) can be cyclically overwritten by the insertion pictures (K_j) in a predetermined order.

23. The circuit arrangement of claim 22 wherein the memory segments (X,Y,Z;A,B,C,D,E) are the same size.

24. The circuit arrangement of claim 22 wherein the memory device has a storage capacity which is $(2-1/VD)$ times the storage capacity required for an insertion picture, where VD is the vertical decimation of the insertion picture.

25. The circuit arrangement of claim 24 wherein the memory segments are the same size and the number of memory segments is $2^* VD-1$, the number of memory segments required for an insertion picture corresponding to the vertical decimation (VD).

26. The circuit arrangement of claim 22 wherein in a manner dependent on the ratio of a reading speed of a read pointer to a writing speed of a write pointer and a relative position of the write pointer in a writing area holding the currently written insertion picture, the decision device decides whether the currently written insertion picture (Kj) or the immediately preceding insertion picture (Kj-1) is read out.

Claims 1-13 have been cancelled without prejudice, and claims 14-26 have been added.
No new matter has been added.

Early consideration and allowance of the application are earnestly solicited.

Respectfully submitted,

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U.S. PATENT APPLICATION

Title: **METHOD AND CIRCUIT ARRANGEMENT FOR PICTURE-
IN-PICTURE INSERTION**

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EP 0 739 130 A2 describes a method for eliminating this seam by storing two fields of a small picture, with the result that the field that can be read is always exactly the one which is currently not being written, and, consequently, the read pointer cannot overtake the write pointer. A first and a second memory, which each store a field, are provided for this purpose. This method has the disadvantage, however, that a storage capacity of two insertion pictures or fields is necessary, which entails corresponding costs.

Accordingly, the invention is based on the object of providing a method and a circuit arrangement for picture-in-picture insertion with which the occurrence of a seam in the insertion picture can be prevented in a cost-effective manner and with a relatively low outlay on apparatus.

This object is achieved by means of a method according to claim 1 and a circuit arrangement according to claim 9. The sub-claims describe preferred developments of the method according to the invention and of the circuit arrangement according to the invention.

The invention is based on the concept that it is not necessary, in principle, to store two whole insertion pictures in order to prevent the write pointer from being overtaken by the read pointer. Instead of using a storage capacity of two insertion pictures, a smaller memory device is subdivided into a suitable number of segments, and suitable decision-making is effected to stipulate whether the currently written or the preceding insertion picture is read out.

Consequently, according to the invention - in contrast to the use of two separate memory segments for the currently written and the preceding insertion picture - if appropriate even the currently written insertion picture is read out if it is ensured that the read pointer does not overtake the write pointer.

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For this purpose, memory segments which, in particular, are the same size can be cyclically overwritten in a predetermined order since, in particular, good periodicity of the operation can also be ensured by this means. The method according to the invention can be achieved in an advantageous manner by means of the dimensionings according to claims 3 to 6, in which case, in particular, the decision criterion may be chosen according to claim 6.

The invention is explained in more detail below using a number of embodiments with reference to the accompanying drawings in which:

Figure 1 shows a block diagram of a circuit arrangement according to the invention,

Figure 2 shows an illustration of a memory device according to a first embodiment of the invention;

Figure 3 shows an illustration of a memory device according to a second embodiment of the invention.

In accordance with Figure 1, a sequence of main pictures $H_i = H_1, H_2, H_3, \dots$ are output from a main picture source 1 via a main picture channel 7 to a control device 3. Correspondingly, from an insertion picture source 2, a sequence of insertion pictures $K_j = K_1, K_2, K_3, \dots$ decimated by a decimation device 12, i.e. reduced in size relative to the main pictures, are output to a memory device S and buffer-stored. In this case, both the main pictures H_i and the insertion pictures K_j are fields which are combined e.g. in a line-offset manner to form the overall monitor picture. Afterward, the sequence of small pictures is read out and forwarded to the control device 3 via an insertion picture channel 8. If an asynchronous main picture source 1 and insertion

picture source 2 are used, the read-out operation of the memory device 8 is effected in a manner exhibiting synchronization with the main pictures H_i. On account of the decimation, in particular the vertical decimation, the read-out of the insertion pictures K_j from the memory device by the control device 3 takes place more rapidly than the operation of writing to the memory device. The control device 3 combines the main pictures H_i and insertion pictures K_j to form an overall picture which is reproduced on a monitor 6.

1/4 picture-in-picture insertion is assumed below, where the small picture is correspondingly decimated in each case by the factor 2 in the horizontal and vertical. According to the invention, it is provided for this purpose that the memory device has a storage capacity of 1.5 fields (decimated relative to the main pictures) and, in accordance with Figure 2, is subdivided into three memory segments X, Y and Z, all three segments being the same size, i.e. each having a storage capacity of 0.5 field (decimated relative to the main pictures) and being continuously overwritten in this cyclic order. Consequently, a writing start segment I and a second writing segment II are in each case required for a field.

Accordingly, in a first storage operation in accordance with Figure 2 a, a memory area formed from the start writing segment X and the second writing segment Y is written to for the first field K₁. The second field K₂ is correspondingly written to the start writing segment Z and the second writing segment X in the subsequent storage operation in accordance with Figure 2 b, the start segment of the first field K₁ already being overwritten in the process of writing to the second writing segment X. During the third storage operation, the field K₃ is correspondingly written to the start writing segment Y and the second writing segment Z in accordance with Figure 2 c. Consequently, at the instant when, in Figure 2 c, the write pointer

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Generally, it can be derived from these considerations that $2 \cdot VD - 1$ segments, each having a storage capacity which corresponds to the quotient of the storage capacity required for an insertion picture and VD, are necessary in order to ensure in each case that either the currently written or the immediately preceding insertion picture can be read out. The total memory space required is thus $(2 - 1/VD)$ times the storage capacity required for an insertion picture. The saving in comparison with the use of two memory areas for a respective insertion picture thus falls with increasing vertical decimation VD. Since the quotient of reading speed and writing speed can, to a good approximation, be applied as VD, the decisive criterion for the selection of the reading start segment is whether the last segment required for writing the current insertion picture is already being written to.

In the case of $1/9$ picture-in-picture insertion, $VD=3$ and, in accordance with Figure 3, it is necessary correspondingly to choose $2 \cdot VD - 1 = 5$ segments A, B, C, D and E each having a storage capacity of $1/3$ field, with the result that a total storage capacity of $5/3$ fields is required. In this case, too, memory segments I, II, III are cyclically overwritten, with the result that the first field is written to the segments A, B and C, the second field to the segments D, E and A, etc. Since the reading speed is about three times higher than the writing speed, the decision criterion to be applied here is whether more than $1/VD = 1/3$ of the memory space required for a field remains to be written to. Consequently, in this case, too, the resulting decision criterion is whether the last segment - in this case the third segment III - required for the current field is already being written to.

In addition to the elimination of the seam, it is furthermore possible to eliminate disturbances that may arise as a result of different field positions in

the insertion channel 8 and main channel 7, e.g., in the case of a picture composed of line-offset fields, disturbances between the upper field in the main channel 7 and the lower field in the insertion

5 channel 8. This can be ensured e.g. by storing an additional line, with the result that the lines of the upper field of the insertion channel, despite the dependence on the raster position of the field of the main channel, are always displayed relatively above the

10 lines of the lower field of the insertion channel.

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Patent claims

1. A method for picture-in-picture insertion, wherein a sequence of insertion pictures ($K_j = K_1, K_2, \dots$) decimated by vertical decimation ($VD \geq 1$) are read into a memory device (S) and subsequently read out, wherein the insertion pictures (K_j) read out are inserted into a sequence of main pictures ($H_i = H_1, H_2, \dots$), wherein the memory device (S) has a storage capacity of less than two insertion pictures (K_j) and is subdivided into memory segments (X,Y,Z;A,B,C,D,E) which are continuously overwritten by the insertion pictures, and wherein a decision is made as to whether the currently written insertion picture (K_j) or the immediately preceding insertion picture (K_{j-1}) is read out, characterized in that more than one memory segment (X,Y,Z;A,B,C,D,E) of the memory device (S) is required for storing an insertion picture (K_j), and in that the memory segments (X,Y,Z;A,B,C,D,E) of the memory device (S) are cyclically overwritten by the insertion pictures (K_j) in a predetermined order.
2. The method as claimed in claim 1, characterized in that the memory segments (X,Y,Z;A,B,C,D,E) are the same size.
3. The method as claimed in claim 1 or 2, characterized in that, in a manner dependent on the ratio of a reading speed of a read pointer to a writing speed of a write pointer and a relative position of the write pointer in a writing area (I,II; I,II,III) holding the currently written insertion picture, a decision is made as to whether the currently written insertion picture

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(Kj) or the immediately preceding insertion picture (Kj-1) is read out.

4. The method as claimed in one of the preceding claims, characterized

in that the memory device has a storage capacity which is $(2-1/VD)$ times the storage capacity required for an insertion picture, where VD is the vertical decimation of the insertion picture.

5. The method as claimed in claim 4, characterized

in that the memory segments are the same size and the number of memory segments is $2*VD-1$, the number of memory segments required for an insertion picture corresponding to the vertical decimation (VD).

6. The method as claimed in claim 5, characterized

in that a memory segment has a storage capacity of $1/VD$ times the storage capacity required for an insertion picture and the decision criterion that is applied is whether the last memory segment (II; III) required for the currently written insertion picture is already being written too.

7. The method as claimed in one of the preceding claims, characterized

in that the insertion pictures (Kj) and main pictures (Hi) are fields of a monitor picture.

8. The method as claimed in one of the preceding claims, characterized

in that a comparison is made to determine whether a main picture (Hi) and an insertion picture (Ki) to be inserted into the latter have an identical field position, and, in the case of a differing field position, an identical field position is achieved by

address shifting of the main picture (Hi) or of the insertion picture.

9. A circuit arrangement for picture-in-picture insertion, in particular for carrying out a method as claimed in one of claims 1 to 8, having a memory device (S) for storing vertically decimated insertion pictures ($K_j = K_1, K_2, \dots$), the memory device (S) having a storage capacity of less than two insertion pictures (K_j) and being subdivided into memory segments (X,Y,Z;A,B,C,D,E) which can be continuously overwritten by the insertion pictures (K_j), having a control device (3) for reading out the vertically decimated insertion pictures from the memory device (S) and for inserting the insertion pictures (K_j) read out into a sequence of main pictures ($H_i = H_1, H_2, \dots$), and

having a decision device for deciding whether the currently written insertion picture (K_j) or the immediately preceding insertion picture (K_{j-1}) is read out,

characterized

in that each memory segment (X,Y,Z;A,B,C,D,E) has a storage capacity of less than one insertion picture (K_j), and

in that the memory segments (X,Y,Z;A,B,C,D,E) of the memory device (S) can be cyclically overwritten by the insertion pictures (K_j) in a predetermined order.

10. The circuit arrangement as claimed in claim 9, characterized

in that the memory segments (X,Y,Z;A,B,C,D,E) are the same size.

11. The circuit arrangement as claimed in claim 9 or 10, characterized

in that the memory device has a storage capacity which is $(2-1/VD)$ times the storage capacity required for an

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insertion picture, where VD is the vertical decimation of the insertion picture.

12. The circuit arrangement as claimed in claim 11, characterized

in that the memory segments are the same size and the number of memory segments is $2 * VD - 1$, the number of memory segments required for an insertion picture corresponding to the vertical decimation (VD).

13. The circuit arrangement as claimed in one of claims 9 to 12, characterized

in that in a manner dependent on the ratio of a reading speed of a read pointer to a writing speed of a write pointer and a relative position of the write pointer in a writing area holding the currently written insertion picture, the decision device decides whether the currently written insertion picture (Kj) or the immediately preceding insertion picture (Kj-1) is read out.

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Abstract

Method and circuit arrangement for picture-in-picture insertion

The invention relates to a method and a circuit arrangement for picture-in-picture insertion, in which a sequence of insertion pictures ($K_j = K_1, K_2, \dots$) is read, with vertical decimation ($VD \geq 1$), into a memory device (S) and subsequently read out, the sequence of insertion pictures (K_j) read out is inserted into a sequence of main pictures ($H_i = H_1, H_2, \dots$) and the memory device (S) is continuously overwritten by the insertion pictures.

In order to prevent the occurrence of a seam during the insertion of the insertion pictures into the main pictures in a cost-effective manner and with a relatively low outlay on apparatus, the memory device (S) is subdivided into memory segments (X,Y,Z) which are continuously cyclically overwritten by the insertion pictures, the memory device (S) has a storage capacity of less than two insertion pictures, and a decision is made as to whether the currently written insertion picture (K_j) or the immediately preceding insertion picture (K_{j-1}) is read out.

Figure 2

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FIG 1

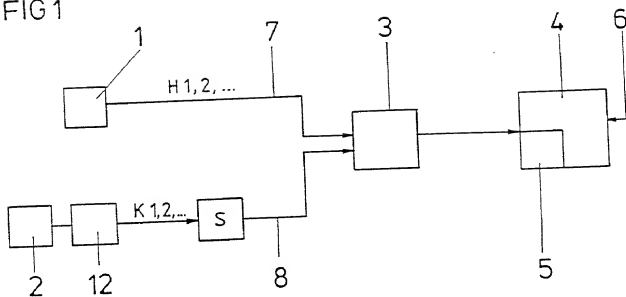


FIG 2a

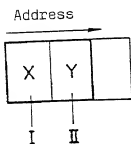


FIG 2b

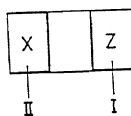


FIG 2c

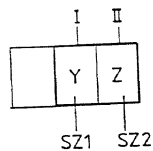
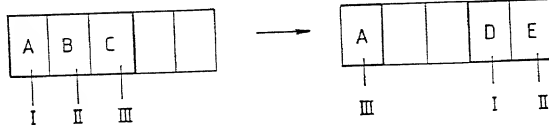


FIG 3



Declaration and Power of Attorney for Patent Application
English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD AND CIRCUIT ARRANGEMENT FOR PICTURE-IN-PICTURE INSERTION

the specification of which

(check one)

- ☒ corresponds to and claims priority of DE 198 43 660.2, filed September 23, 1998 and PCT/DE99/02994, filed September 17, 1999.
- ☒ was filed on 03/23/01 as United States Application No. or PCT Application No. 09/806,003 and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

<u>DE 198 43 660.2</u> (Number)	<u>Germany</u> (Country)	<u>23 September 1998</u> (Day/Month/Year Filed)	[]
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	[]
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	[]

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

I hereby claim the benefit under 35 U.S.C. Section 120 of the United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark office all information known to me to be material to patentability as defined in Title 37, C.F.C., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

PCT/DE99/02994

(Application Serial No.)

17 September 1999

(Filing Date)

Pending

(Status)

(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)

(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)

(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

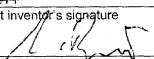
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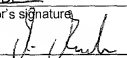
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